

1970

**OPERATING
SUMMARY**

TILLSONBURG

water pollution control plant

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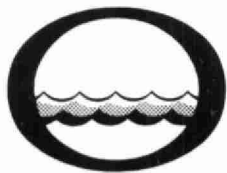
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Water management in Ontario

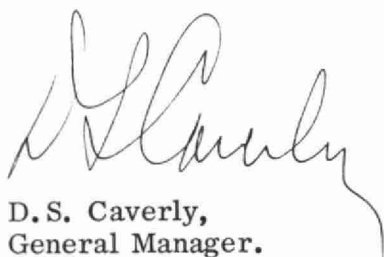
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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TILLSONBURG
water pollution control plant

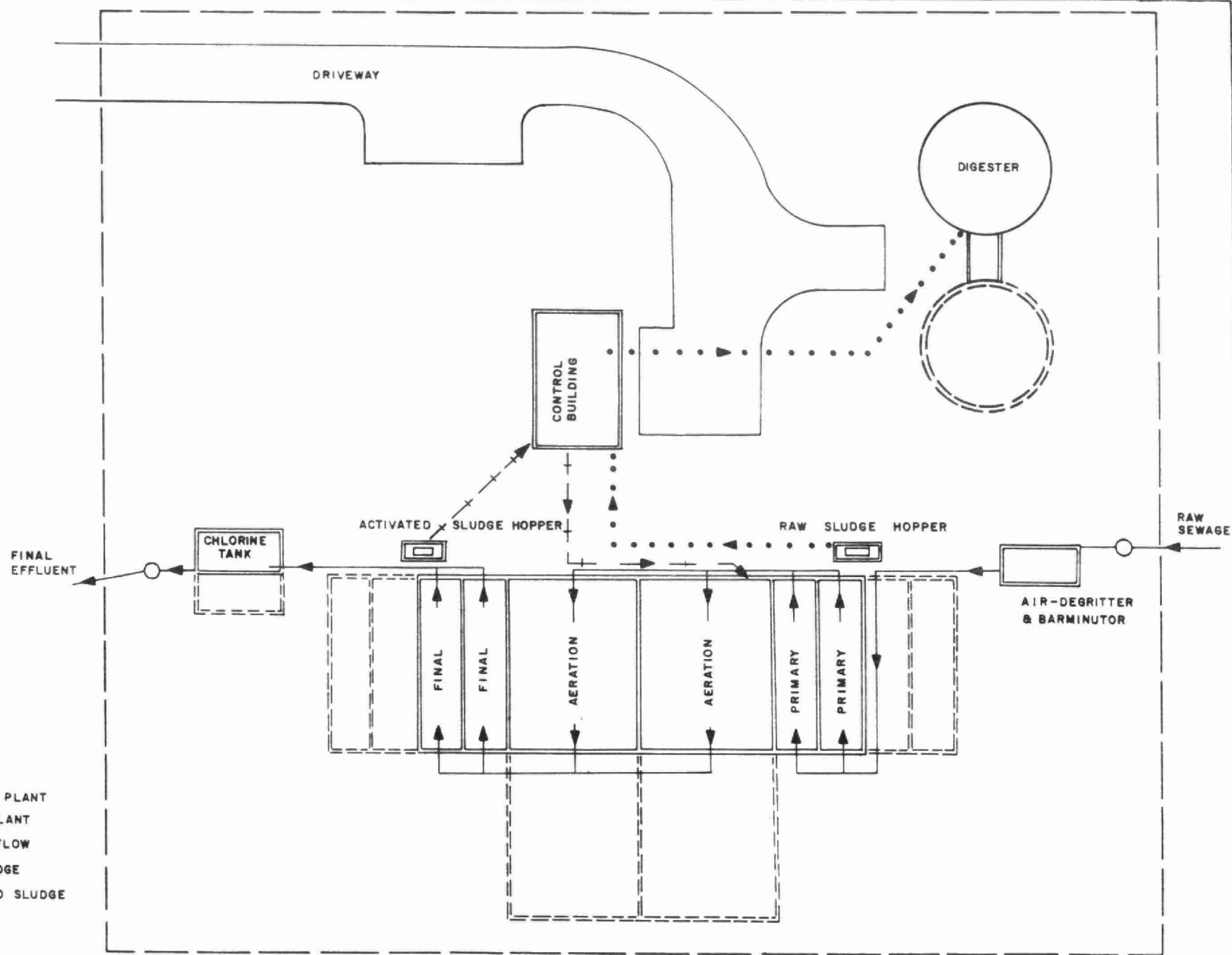
operated for

THE TOWN OF TILLSONBURG

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



TILLSONBURG S.T.P.

DESIGN DATA

PROJECT NO. 2-0012-58

DESIGN FLOW	0.665 mgd	DESIGN POPULATION	7,000
BOD - Raw Sewage	235 mg/l	SS - Raw Sewage	250 mg/l
- Removal	95%	- Removal	95%

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: One Model "C" (18")

Grit Removal

Type: C.P. Aer-Degritter
Size: One 13' x 6' x 8' (3,900 gal)
Retention: 8.4 min

Primary Sedimentation

Type: Jeffrey
Size: Two 50' 4" x 10' x 8' (50,300 gal)
Retention: 1.82 hours
Loading: Surface, 795 gal/ft²/day
Weir, 16,000 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; single-pass
Size: Two 50' x 30' x 13' (281,000 gal)
Retention: 10.2 hours

Diffusers

Type: Walker Spargers
Spacing: 28 @ 20" c-c (each tank)

Air Supply

Type: Roots-Connersville
Size: Two 875 scfm @ 7.5 psi

Secondary Sedimentation

Type: Jeffrey
Size: Two 50' 4" x 10' x 12' 3"
(77,000 gal)
Retention: 2.8 hours
Loading: Surface, 795 gal/ft²/day
Weir, 4820 gal/ft/day

CHLORINATION

Type: W & T A731
Size: One 400 lb/day

Chlorine Contact Chamber

Size: One 20' x 11' 3" x 9' 9"
(13,950 gal)
Retention: 30.2 min

OUTFALL

- to creek

SLUDGE HANDLING

Digestion System - Single-stage

Type: C.P. Pontoon-type floating cover;
mixed by recirculation
Size: One 45' dia x 20' swd (36,000 cu ft
or 224,000 gal)
Loading: 1.32 lb/cu ft/mon

PUMPING STATION

John Pound Street Pumping Station

Type: Chicago Pump
Size: One 458 gpm @ 26 $\frac{1}{2}$ ' tdh
One 687 gpm @ 29 $\frac{1}{2}$ ' tdh
One 917 gpm @ 33 $\frac{1}{2}$ ' tdh
with One C.P. Barminutor
Type "B" (18")

'70 REVIEW

FLows	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.58	—	17.6	—
High	.95	December	25.3	December
Low	.29	June	13.0	June

GENERAL

The project consists of a 0.67 mgd diffused air activated sludge sewage treatment plant including comminution, grit removal, chlorination, single stage digestion and liquid sludge haulage. It also includes an above-ground pumping station and forcemain, and approximately 3½ miles of sewers varying in diameter from eight to 18 inches. The plant is built on a two-acre plot in Coronation Park, in the southeast section of the town. It is downstream and upwind of the town.

During 1970, inspections of the structures and grounds showed that they were well maintained and in good condition. An electrical and mechanical inspection of the project equipment revealed no major deficiencies.

EXPENDITURES

The operating cost for the year was \$30,772.36 or 6.8 cents per lb. of BOD removed. The unit cost of treating one million gallons was \$146.05.

PLANT FLOWS and CHLORINATION

The total gallonage treated in 1970 was 210.7 million. The plant operated at 77% of hydraulic capacity over the year, at 122% during the peak month and 142% during the peak day. During the spring run off period, flows in excess of the secondary treatment capacity received only primary treatment and super chlorination. From the flow probability graph, it can be seen that the design capacity of the plant was exceeded 18% of the time.

The final effluent was chlorinated for the full year. A total of 9970 pounds of chlorine was used at an average dosage of 4.7 mg/l. The average chlorine residual was 0.5 mg/l in the final effluent prior to discharge in Otter Creek.

PLANT LOADING and EFFICIENCY

The average raw sewage strengths in 1970 were 222 mg/l BOD and 376 mg/l suspended solids. The average strengths in the final effluent of 11 mg/l BOD and 22 mg/l suspended solids, represented removal efficiencies of 95 and 94% respectively. The final effluent met the OWRC objectives approximately 95% of the time for BOD and 50% of the time for suspended solids. The sample results for suspended solids are exceptionally high due to a change in sampling procedure and during 1971 a more representative method of sampling will be used.

Approximately 0.45 million pounds of BOD and 0.78 million pounds of suspended solids were removed during the year. The primary effluent had an average strength of 164 mg/l and 271 mg/l suspended solids, representing percent removals of 26 and 28 in the primary section of the plant.

A total of 12.6 cu. yds. of grit was removed. This represents a removal quantity of 1.62 cu. ft. per million gallons which is normal for this type of plant.

SLUDGE DIGESTION and DISPOSAL

A total of 3.5 million gallons of raw sludge were pumped to the digester.

A total of 0.62 million gallons of digested sludge at an average concentration of 2.1% was trucked away for disposal. This amounted to 17.7% of the raw sludge pumped to the digester or 17.5 cu. yd. per million gallons of raw sewage.

AERATION

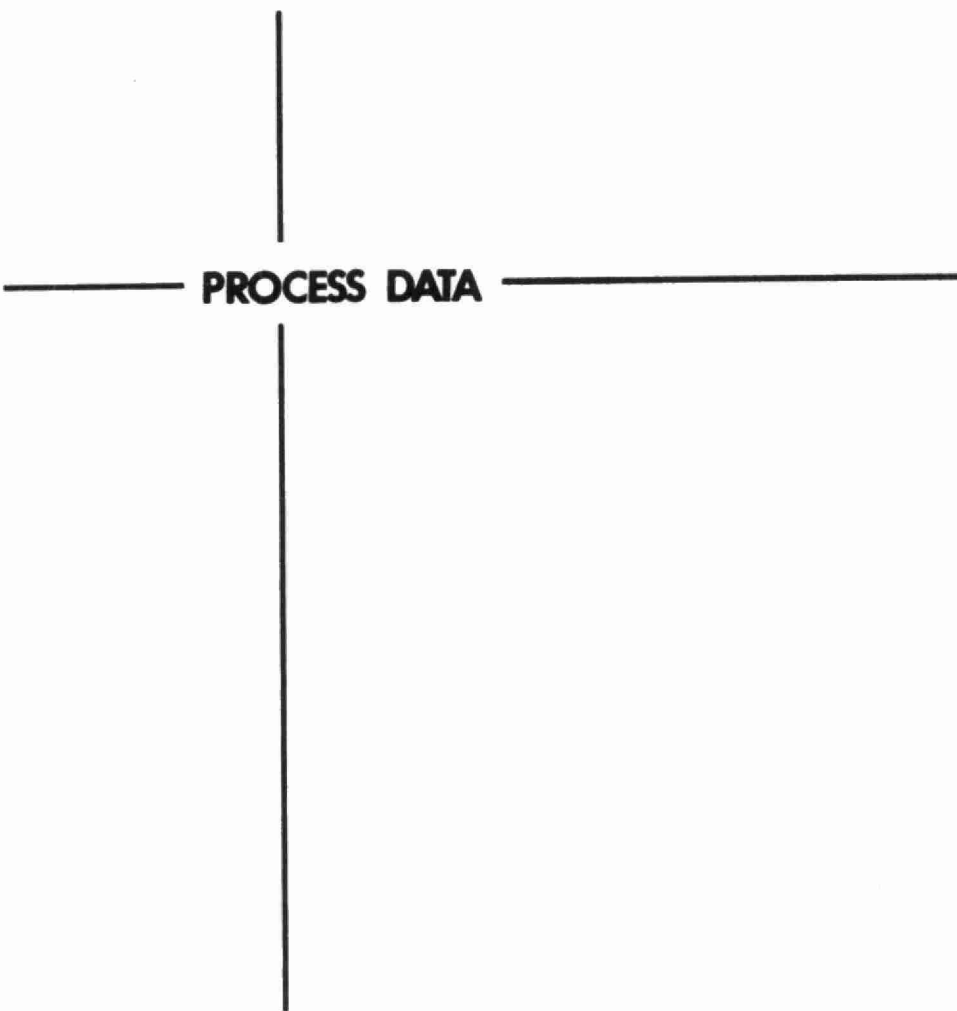
The average BOD entering the aeration section was 164 mg/l and the average loading of 0.15 pounds of BOD per pound of MLSS. An average of 2500 cubic feet of air was supplied per pound of BOD removed.

CONCLUSIONS

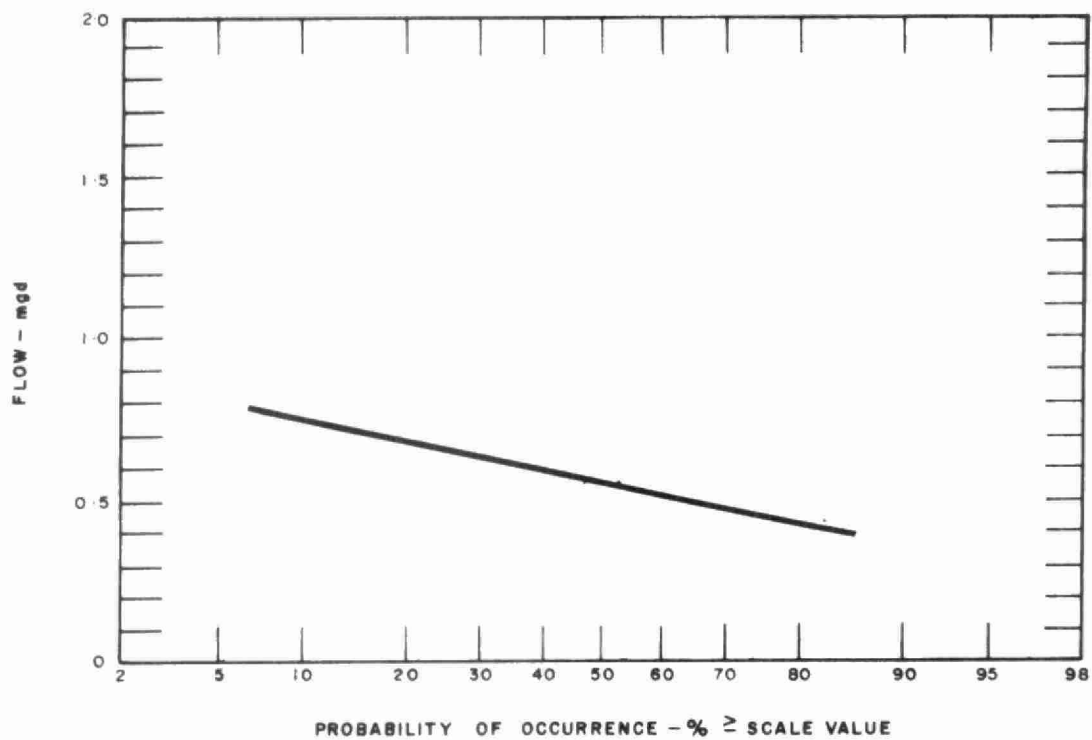
This project was well run throughout 1970 and experienced no major problems.

Although treatment demands were lower than in the previous year, local industrial growth and more residential subdivisions require that the expansion of the project proceed as planned.

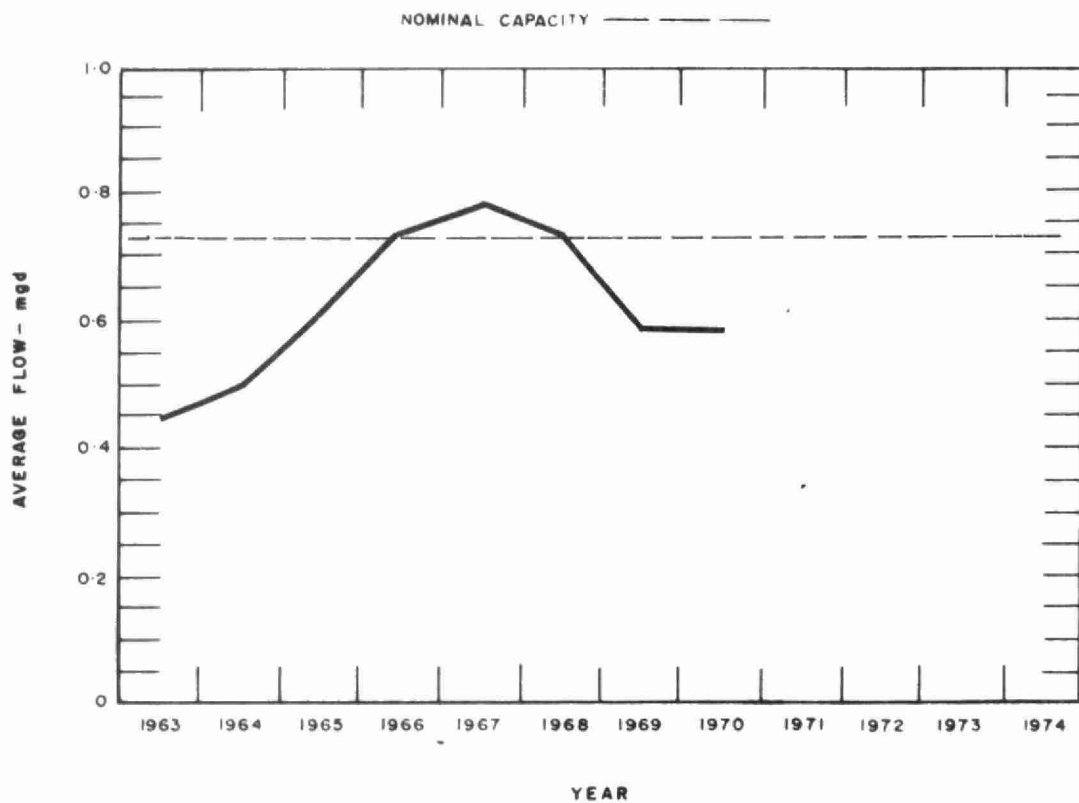
During 1970, the treatment plant, pumping station, forcemain and outfall sewer became provincially-financed under project no. 1-0137-67. Expansion plans will be completed and construction should begin in the summer of 1971. Project 2-0012-58 continues to exist as trunk sewers only.



PROCESS DATA

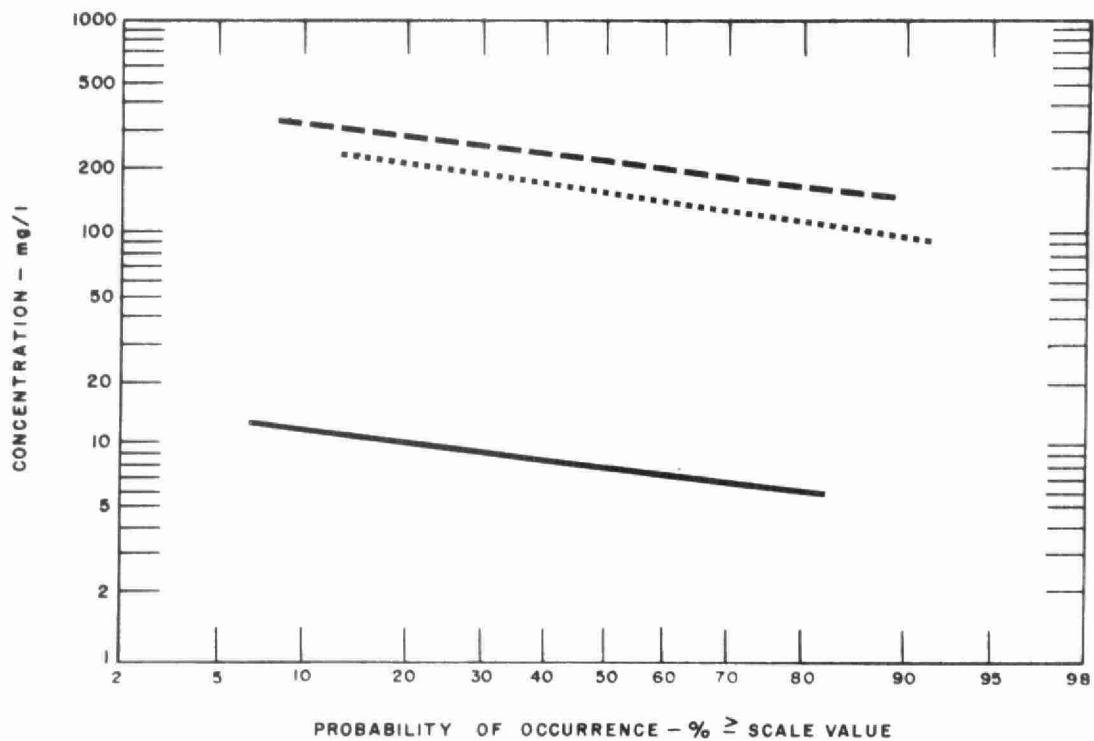


FLAWS

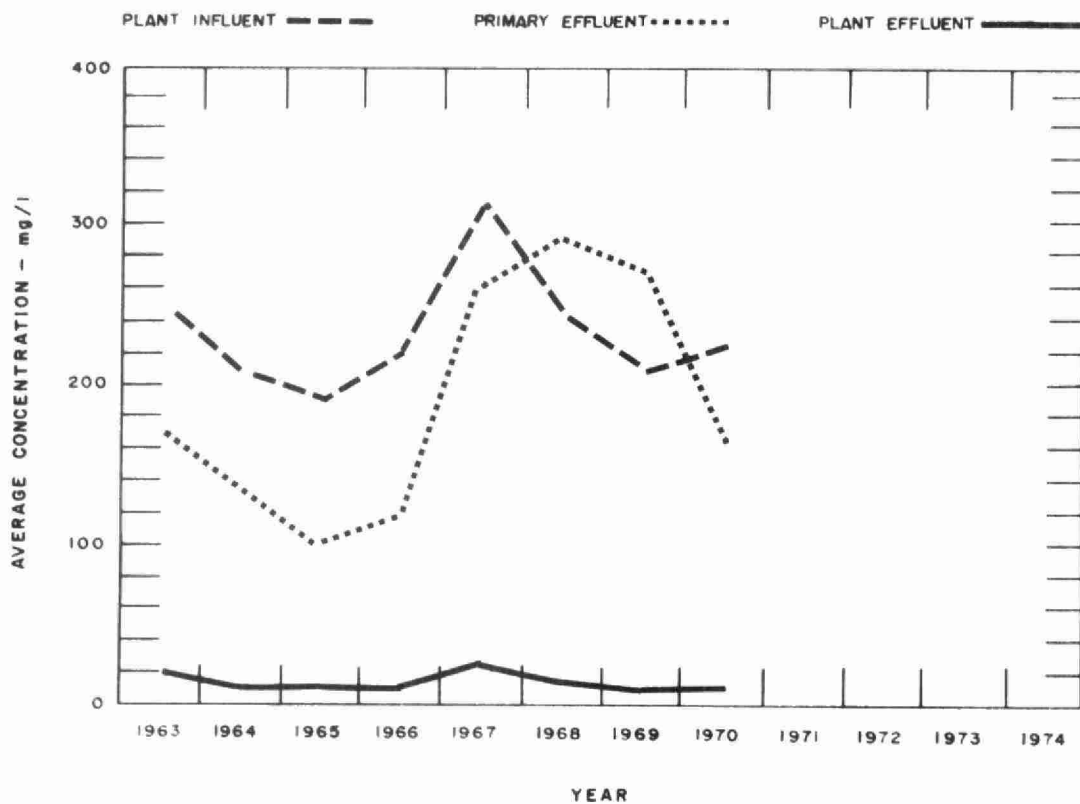


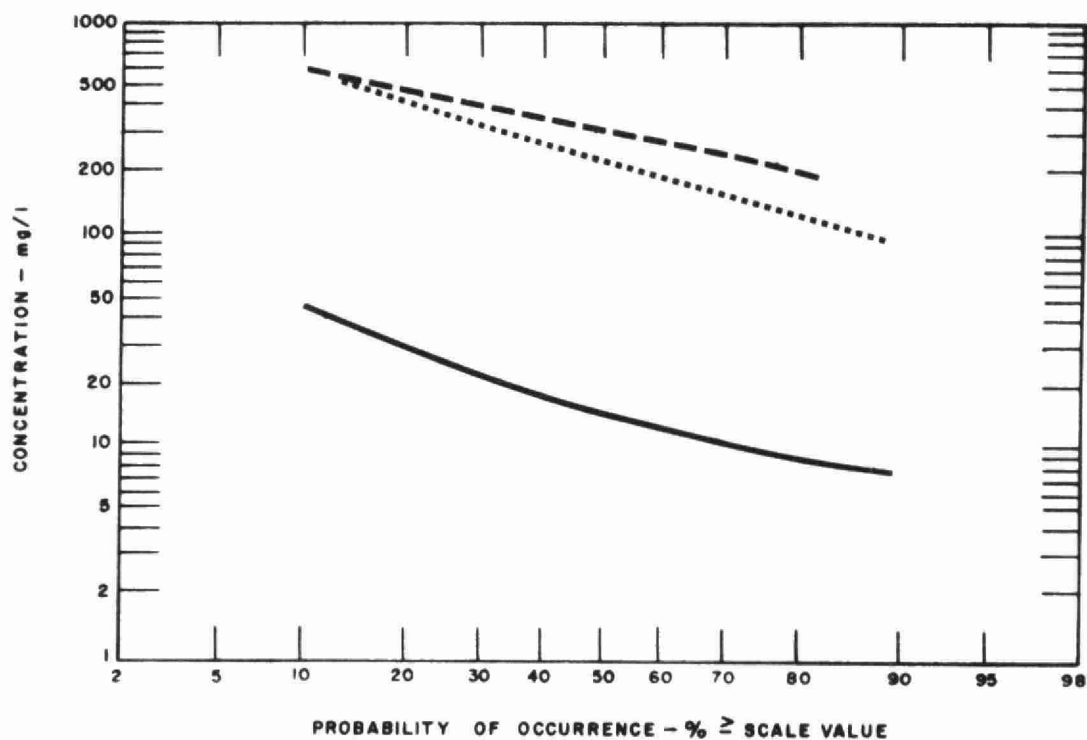
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	13.8	.47	.61	.43	670	4.8
FEB	13.4	.48	.59	.40	610	4.5
MAR	15.3	.49	.77	.41	670	4.4
APR	14.9	.50	.66	.43	620	4.2
MAY	13.9	.45	.55	.36	800	5.8
JUNE	13.0	.43	.66	.29	770	5.9
JULY	19.2	.62	.84	.50	760	3.9
AUG	20.6	.66	.73	.60	960	4.7
SEPT	19.6	.65	.77	.58	910	4.7
OCT	19.5	.63	.71	.54	1060	5.4
NOV	22.2	.74	.94	.68	1090	4.9
DEC	25.3	.81	.95	.74	1060	4.2
TOTAL	210.7	-	-	-	9970	-
AVERAGE	-	.58	-	-	830	4.7

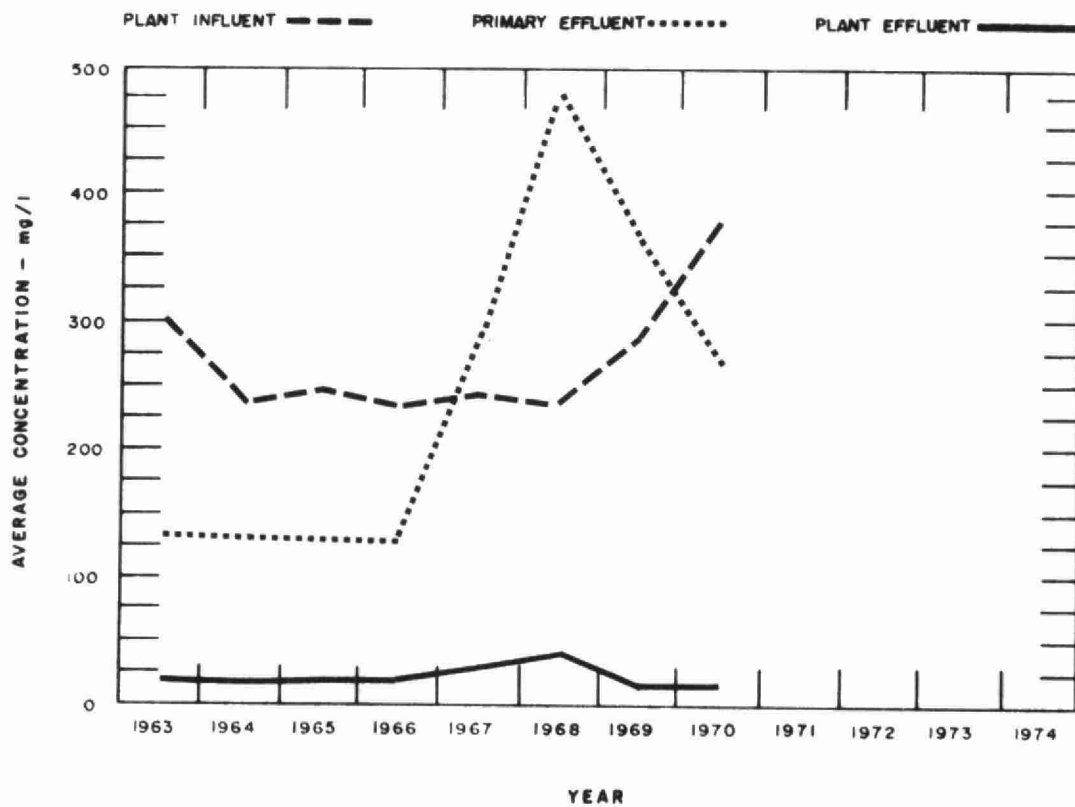


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	4	235	4	9	96	31	4	276	4	15	95	36	22
FEB	4	200	4	41	80	21	4	245	4	13	95	31	24
MAR	4	198	4	17	91	28	6	242	7	24	90	33	28
APR	5	176	5	16	91	24	10	236	10	40	83	29	36
MAY	4	188	4	9	95	25	8	288	8	16	95	38	23
JUNE	4	183	4	9	95	23	8	319	8	19	94	39	25
JULY	4	198	4	8	96	36	9	342	9	28	92	60	40
AUG	4	380	4	9	98	76	8	814	8	21	97	163	26
SEPT	6	237	6	5	98	45	10	359	10	22	94	66	25
OCT	7	226	7	6	97	43	8	385	8	14	96	72	32
NOV	7	204	7	5	98	44	8	339	8	21	94	71	31
DEC	7	236	7	7	97	58	8	561	8	19	97	137	28
TOTAL	60	-	60	-	-	454	91	-	92	-	-	777	340
AVERAGE	-	222	-	11	95	38	-	376	-	22	94	65	-

NOTE - n is the number of samples taken

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M		AIR USED 1000 cu ft lb BOD	WASTE SLUDGE 10 ³ lb/day
		BOD	SS	BOD	SS		lb BOD			
		mg/l	mg/l	mg/l	mg/l		lb MLSS	lb BOD		
JAN	.47	160	167	9	15	2270	.12	2.2	-	
FEB	.48	122	201	41	13	2190	.10	4.1	-	
MAR	.77	119	270	17	24	2490	.13	2.0	-	
APR	.50	154	397	16	40	2930	.09	2.4	5.0	
MAY	.45	250	413	9	16	3730	.11	2.4	4.0	
JUNE	.43	225	486	9	19	2610	.13	2.8	5.1	
JULY	.62	141	284	8	28	1910	.16	3.1	2.4	
AUG	.66	148	251	9	21	1640	.21	2.8	2.5	
SEPT	.65	107	139	5	22	1990	.13	3.8	4.0	
OCT	.63	160	116	6	14	2270	.16	1.8	3.4	
NOV	.74	184	231	5	21	2360	.21	1.2	4.1	
DEC	.81	187	220	7	19	2310	.23	1.0	4.2	
TOTAL	-	-	-	-	-	-	-	-	-	-
AVERAGE	.51	164	271	11	22	2390	.15	2.5	3.8	

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ⁵ gal	%	%	10 ⁵ gal	%	%	10 ⁵ gal	%	cu yd	cu yd
JAN	2.5	3.7	-	.4	2.4	-	2.0	2.4	-	261
FEB	2.1	3.9	-	.4	2.4	-	1.8	2.6	-	215
MAR	2.3	3.8	-	.4	2.4	-	2.0	2.7	-	234
APR	2.9	3.7	-	.5	2.2	-	2.4	2.2	-	306
MAY	3.3	2.8	-	.7	2.0	-	2.4	1.5	-	425
JUNE	3.2	2.8	-	.7	1.8	-	1.8	1.8	-	425
JULY	2.2	2.8	-	.7	2.4	-	2.4	1.9	-	397
AUG	3.3	2.6	-	.6	2.3	-	2.4	1.9	-	338
SEPT	3.2	2.3	-	.5	1.9	-	2.5	1.9	-	306
OCT	3.1	2.6	-	.4	1.9	-	2.6	1.7	-	256
NOV	2.8	3.1	-	.4	2.5	-	2.4	2.4	-	256
DEC	2.9	3.6	-	.5	2.9	-	2.5	2.5	-	275
TOTAL	34.9	-	-	6.2	-	-	27.2	-	-	3694
AVERAGE	2.9	3.1	-	.5	2.3	-	2.3	2.1	-	308

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Date Due

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Water management in Ontario